

# A LARGE *EQUISETUM* FROM THE HAWKESBURY SANDSTONE.

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(PALÆONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL  
SURVEY OF NEW SOUTH WALES.)

(Plate xvii.)

At a Meeting of this Society, held on May 28th, Dr. J. C. Cox exhibited\* a remarkably fine example of the basal portion of an Equisetaceous plant from the Hawkesbury Sandstone of North Shore, Port Jackson. It consists of eight internodes forming the obconical basal termination of the stem. As this peculiar reversed cone-like base occurs both in *Calamites* and *Equisetum*,† it becomes important to investigate the matter of its identity closer, especially as it has a strong bearing on the question of the age of the deposit.

The *Calamites* have a greater analogy with the *Equisetums* than with any other plants,‡ but are distinguished by possessing verticillate leaves entirely free, or confluent at their bases, and by the presence of clusters of sporangia similar to those of the *Lycopods*.§ In the *Equisetums*, on the other hand, the internodes of the stem are each terminated superiorly by a verticel of leaves united into a lobed or regularly dentate sheath,|| which is persistent,¶ and is

\* Abstr. Proc. Linn. Soc. N. S. Wales, 28th May, 1890, p. iii.

† Schimper, *Traité Pal. Vég.*, 1869, I., p. 257.

‡ Grand'Eury, *Flore Carb. Départ. de la Loire*, 1877, pt. 1, p. 12.

§ Schimper, *loc. cit.*, p. 291.

|| Schimper, *loc. cit.*, p. 255.

¶ Renault, *Cours Bot. Foss.*, 1882, pt. 2, p. 157.

one of the best means of recognising the genus. In the absence of any of these characters, however, differentiation between the genera is by no means easy. The same remark also applies to the genera *Phyllothea*, *Schizoneura*, at least to some extent, and perhaps to *Vertebraria* also. In the first-named there is a sheath similar to *Equisetum*, but it is prolonged into long linear leaves diverging from the stem in whorls. In *Schizoneura* we again meet with a sheath, and a "number of longitudinal leaflets with a central vein attached along their margins."\* This sheath then undergoes a peculiar subdivision, which need not be further referred to. As regards *Vertebraria*, the peculiarities of its stem at once distinguish it.

The portion of the stem now before us is six inches long, and in its present compressed state nearly four in width, tapering at the lower or distal end to an obtuse point. Within the length of the specimen there are eight internodes, the foremost but one, and best preserved, being nearly one and a-half inches long. The lower or distal internodes are half an inch long. The rate of decrease of the stem is but gradual, and the amount of curvature very little. The nodes are now represented by narrow impressed lines of a dark colour, and here and there are interrupted in their course by oval cicatrice-like scars. The vertical costæ, or ribs, are narrow, now merely dark coloured lines, usually about one-sixteenth of an inch apart, and invariably opposite on contiguous internodes.

So far as I am aware the genus *Calamites* has not been met with in the Permo-Carboniferous Coal Measures of N. S. Wales at all, nor is it satisfactorily known from the associated Marine beds, although the late Prof. de Koninck recorded † *C. varians*, Gernar, as occurring in N. S. Wales, but without definite locality.

*Calamites* has certainly never been obtained from any of our higher Secondary beds. Nor, am I aware of any recorded occur-

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\* Feistmantel, Pal. Indica, Gondwana Flora, 1880, iii., No. 2, pt. 1, p. 59.

† Foss. Pal. Nouv. Galles du Sud, 1877, pt. 3, p. 142.

rence of *Equisetum* either in the Permo-Carboniferous Coal Measures, or Hawkesbury-Wianamatta Series of this Colony. But two species are known from the Mesozoic plant-beds of Queensland—*E. rotiferum*, Ten. Woods, and *E. (?) latum*, Ten. Woods.\* The balance of evidence, therefore, from this point of view, would lead to the belief that our specimen is an *Equisetum*, and, in such a case, it is the first reliable record of the presence of this genus in our Hawkesbury Sandstone.

With regard to the specimen itself, the general appearance reminds one more of the finely costate *Equisetums* of the Continental Trias than of the coarser-ribbed Palæozoic *Calamites*; compare, for instance, the figure of *Equisetum Mougeotti*, given by Schimper,† from the Grès-bigarré of the Vosges. I suspect, however, that the nearest ally will be found in *E. (?) latum*, Ten. Woods, from Rosewood, near Rockhampton. This plant is described‡ as having a finely-ribbed stem, with internodes three inches high, and the ribs about twenty to the inch. The ribs in our fossil are somewhat less, about fifteen. There is nothing to prevent the internodes in the Hawkesbury fossil from lengthening out to the measurement of *E. (?) latum*, judging from the rapid increase which certainly takes place in this direction in the specimen under description. The Mining and Geological Museum contains specimens of a large *Equisetum*, collected by Mr. Soutter, from the Esk Valley, forty-six miles W.N.W. of Ipswich, Queensland, and presented by him. In a specimen now before me, two internodes measure seven and a-half inches in length, and both imperfect, the upper being four and three-quarter inches long. The greatest compressed breadth is three inches. The riblets are finer than those of our Hawkesbury specimen, and more numerous in a given space.

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\* Proc. Linn. Soc. N. S. Wales, 1883, viii., pt. 1, pp. 66 and 87.

† Schimper, *loc. cit.*, Atlas, t. 12, f. 4.

‡ Proc. Linn. Soc. N. S. Wales, 1883, viii., pt. 1, p. 87, t. 2, f. 1.

In the mean time, rather than coin a new name for this fossil, it will be better to provisionally regard it as *E. latum*, Ten. Woods.

The scars noticeable at some of the nodes are probably those left by rootlets, similar to those figured by Schimper in *Calamites*.\*

I am indebted to Dr. J. C. Cox's kindness for an opportunity of noticing this very interesting plant.

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#### EXPLANATION OF PLATE.

Basal portion of the decorticated stem of an *Equisetum* from the Hawkesbury Sandstone of North Shore, Port Jackson.

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\* Schimper, *loc. cit.*, Atlas, t. 13, f. A and B.